IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Attorney Docket No.: **Juniper-26 (JNP-0325)**

Appl. No.: **10/702,184**

Appellant: **Ina MINEI, et al.**

Filed: **November 5, 2003**

Title: **CONTROLLING THE SIGNALING OF LABEL-SWITCHED PATHS USING A LABEL DISTRIBUTION PROTOCOL EMPLOYING MESSAGES WHICH FACILITATE THE USE OF EXTERNAL PREFIXES**

TC/A.U.: **2155**

Examiner: **Bharat Barot**

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S I R:

APPEAL BRIEF

Further to the Notice of Appeal filed on August 29, 2008, which set a period for response to expire on October 29, 2008, that period being extended one (1) month to expire on November 29, 2008, the Appellant requests that the Board reverse all outstanding grounds of rejection in view of the following.

I. Real Party In Interest

The real party in interest is Juniper Networks, Inc. An assignment of the above-referenced patent application from the inventors to Juniper Networks, Inc. was recorded in the Patent Office starting at Frame 0171 of Reel 014679.

II. Related Appeals and Interference

There are no related appeals or interferences.

III. Status of Claims

Claims 1-14, 16, 17, 19 and 24-48 are pending. Claims 15, 18 and 20-23 has been canceled.

Claims 45-48 are objected to.

Claims 1-14, 16, 17, 19 and 24-48 stand rejected. More specifically, claims 14, 16, 17, 19 and 24 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter, and claims 1-14, 16, 17, 19 and 24-48 stand rejected under U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,965,592 ("the Tinsley patent") in view of U.S. Patent No. 7,151,775 ("the Renwick patent").

The rejection of claims 1-14, 16, 17, 19 and 24-48 is appealed.

IV. Status of Amendments

There were no amendments filed subsequent to the final Office Action mailed on May 29, 2008 (Paper No. 20080514).

V. Summary of the Claimed Subject Matter

Before the claims are summarized in accordance with 37 C.F.R. § 41.37(c)(1)(v), some background is provided which should help the Board understand the context in which the claimed invention may be used.

The claimed invention concerns improving the means by which certain predefined paths (label-switched paths) through a communications network are established. As mentioned in the present application, at least some embodiments consistent with the claimed invention advantageously permit label distribution protocol (LDP)-signaled label-switched paths (LSPs) ***without requiring information about remote autonoumous systems (ASs)*** (e.g., forwarding equivalency class (FEC) element prefixes or host addresses that are external to the interior gateway protocol (IGP)) to be injected into the local IGP. Specifically, the specification discusses problems the claimed invention advantageously address as follows:

> RFC 3036 describes label mapping message procedures in § 3.5.7.1. In particular, this section specifies that an LSR [label switching router] receiving a label mapping message from a downstream LSR for a Prefix or Host Address FEC Element should not use the label for

forwarding unless its routing table contains an entry that exactly matches the FEC element. This may be provided to ensure that the LDP LSP will follow the shortest path calculated by a routing protocol, and to ensure that there will be no routing loops. ***This requirement is not a problem when the LSP is within a single network domain*** (or a single autonomous system (AS)), such as the case illustrated in Figure 4 in which an LSP is provided between provider edge devices (PE) 420, 430 in a network domain 410, to provide virtual private network (VPN) services to customer edge devices (CE) 425, 435 for example.

However, consider a case as illustrated in Figure 5 in which an LSP is included in more than one AS 510, 520, 530. This situation may arise either in a multi-provider scenario, or in the case where a single provider has several ASs. LDP and a border gateway protocol (BGP) could be used to signal labels. However, routing information known by nodes in AS 510 might not include information about nodes in AS 520 or AS 530. The routing information could be updated to include information about nodes in other ASs (e.g., routes for LDP FECs could be injected into an IGP), but this may be undesirable. For example, in a multi-AS topology , an service provider ("SP") may not want to advertise a PE's addresses into the local IGP. Rather than using LDP and BGP, a resource reservation protocol (RSVP) could be used end-to-end. However, end-to-end RSVP is not standard and is not as scalable. Further, many network service providers are already running LDP in their networks. Another alternative solution is to use end-to-end BGP. However, this requires a three-label stack (e.g., 500:900:PE1 and some customer hardware does not support three label stacks.

> In view of the foregoing, it may be desirable to allow LDP-signaled LSPs without requiring information about remote ASs (e.g., FEC element prefixes or host addresses that are external to the IGP) to be injected into the local IGP. [Emphasis added.]

(Paragraphs [0016]-[0018] of the present application) Furthermore, Figure 11 and the specification illustrate an example of an advantageous application of the principles of the invention to a virtual private network (VPN) environment. Specifically, the specification provides:

> Suppose a customer wants to establish a VPN between customer edge devices (CEs) 1140 and 1150. It may be desired to establish LSP 1190 for this purpose. To make matters difficult, the LSP 1190 spans multiple network domains (or ASs) 1110, 1120 and 1130.
>
> AS 1110 may include a service provider edge device (PE 1) 1112, ASBR 1 1116 that facilitates connectivity with other ASs, and one or more internal nodes 1114, such as LSRs. CE 1140 accesses AS 1110 via PE1 1112. Similarly, AS 1130 may include a service provider edge device (PE 2) 1132, ASBR 4 1136 that facilitates connectivity with other ASs, and one or more internal nodes 1134, such as LSRs. CE 1150 accesses AS 1130 via PE2 1132. Finally, AS 1120 may include ASBRs 1122 and 1124 facilitating communications with AS 1110 and AS 1130, respectively.
>
> Suppose further that AS 1110 and 1130 support LSPs internally using LDP. Moreover, suppose that AS 1110 and 1130 each support LSPs via AS 1120 using BGP. In this example, desired LSP 1190 can be established as follows. PE 1, which may serve as an ingress LSR can advertise its

address or prefix as a FEC element using LDP within AS 1110. Nodes 1114 can use LDP to bind its own labels to the FEC and advertise the FEC-label bindings. ASBR 1 1116, advertises the FEC to ASBR 2 1122 with a BGP message including the associations PE 1/32, label 300. ASBR 2 1122 advertises the FEC to ASBR 3 1124 with a BGP message including the associations PE 1/32: RD1, label 700. ASBR 3 1124 advertises the FEC to ASBR 4 in AS 1130 with a BGP message including the associations PE 1/32, label 800.

At this point, if normal LDP is used in AS 1130, problems will be encountered. More specifically, nodes 1134 (as well as PE 2 1132) will need information about PE 1 in their routing tables in order to meet the requirements of RFC 3036. However, if an IGP (such as open shortest path first (OSPF) or Intermediate System-Intermediate System (IS-IS)) is used, these nodes 1134 will not have any information about PE 1 in their routing tables.

Although these routes could inject an entry for PE 1 in their routing tables, AS 1130 might not want to for a number of reasons. For example, AS 1130 might not trust information in BGP advertisements, perhaps because they come from an external AS over which they may have little control or trust. Even if AS 1130 did trust the route information (for example AS 1110 and 1130 might belong to the same entity), it might not want to clutter the routing tables of its nodes with information about nodes in other ASs. For example, suppose there are numerous VPNs that span multiple ASs. In such a case, the additional overhead on the routing tables of the nodes could impact performance.

The invention avoids this problem by extending LDP messaging, especially LDP label mapping messages. Under the invention, instead of testing an LDP

> message using the address (or prefix) of PE 1 1112, which is not discoverable by an IGP and therefore not likely to be included in routing tables of nodes in AS 1130, it could test the LDP message using an RNH address such as the address of ASBR 4 1136, which is discoverable by an IGP and therefore likely to be included in the routing tables of nodes in AS 1130. Thus, by (1) decoupling the FEC element from a routing table entry, and (2) specifying a different address on which to apply LDP tests, e.g., that of ASBR 4 1136, LDP signaling of an LSP spanning more than one network domain is enabled by the invention.

(Paragraphs [0064]-[0069] of the present application) With this background in mind, the claims defined by 37 C.F.R. § 41.37 (c) (1) (v) are summarized.

Independent claim 1 recites a method comprising (a) receiving a message for establishing a label-switched path (This is supported, for example, by element 902 of Figure 9 and paragraph [0052] of the specification.); (b) determining whether or not the message includes extended information (This is supported, for example, by element 730 of Figure 7, element 906 of Figure 9 and paragraphs [0042], [0043] and [0052] of the specification.); (c) if the message does not include extended information, determining, using a first part of the message and routing information, whether or not to generate a further message to signal the label-switched path (This is supported, for example, by element 720 of Figure 7, elements 815, 820 and 830 of Figure 8, element 908 of Figure 9, and paragraphs [0042], [0046] and [0052] of the specification.); and (d) if the message does include

extended information, determining, using a second part of the message and routing information, whether or not to generate a further message to signal the label-switched path .(This is supported, for example, by element 730 of Figure 7, elements 815, 825 and 830 of Figure 8, elements 906, 910, 916 and 918 of Figure 9, and paragraphs [0042], [0047] and [0055] of the specification.)

Corresponding independent apparatus claim 25 recites corresponding means for performing the acts of receiving and determining recited in independent method claim 1. Accordingly, the means are supported, at least in part, by the sections of the application cited above with reference to the corresponding acts of method claim 1. Further, the "means for receiving a message for establishing a label-switched path" are supported, for example, by 1032 of Figure 10, and paragraphs [0060]-[0063] of the specification and the "means for determining whether or not the message includes extended information are supported", the "means for determining, using a first part of the message and routing information, whether or not to generate a further message to signal the label-switched path if the message does not include extended information" and the "means for determining, using a second part of the message and routing information, whether or nor to generate a further message to signal the label-switched path if the message does include extended information" are supported, for example, by 1010 of Figure 10, and paragraphs [0060]-[0063] of the specification.

Independent claim 14 recites a machine-readable storage device storing a machine-readable message. (This is supported, in general, by Figure 7, element 1020 of Figure 10 and paragraphs [0060] and [0061].) The stored machine-readable message includes (a) a first field including a label stored in association with a label-switched path (This is supported, for example, by element 710 of Figure 7 and paragraphs [0041] and [0042].); (b) a second field including forwarding equivalency class information stored in association with the label-switched path (This is supported, for example, by element 720 of Figure 7 and paragraphs [0041] and [0042].); and (c) a third field including label-switched path signaling resolution information stored in association with the label-switched path, the label-switched path signaling resolution information including one of a host address and a host prefix (This is supported, for example, by element 730 of Figure 7 and paragraphs [0041]-[0043].), wherein a forwarding device, receiving the message, processes the message to (1) determine whether or not the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field, and (2) use the label included in the first field for forwarding data only if the forwarding device determined that the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field (This is

supported, for example, by Figure 8 and paragraphs [0045]-[0049].).

Independent claim 44 recites a method comprising (a) receiving a first message for establishing a first label-switched path (This is supported, for example, by element 902 of Figure 9 and paragraph [0052] of the specification.); (b) determining that the first message does not include extended information (This is supported, for example, by Figure 7, element 815 of Figure 8, elements 906 and 908 of Figure 9 and paragraphs [0042], [0043], [0045], [0046] and [0052] of the specification.); (c) finding a first label-switched route matching a first part of the first message (This is supported, for example, by element 720 of Figure 7, elements 815, 820 and 830 of Figure 8, element 908 of Figure 9, and paragraphs [0042], [0046] and [0052] of the specification.); (d) determining that an interface of the first matching label-switched route found matches an interface on which the first message was received (This is supported, for example, by elements 830 and 835 of Figure 8 and paragraph [0046] of the specification.); (e) generating a first further message to signal the first label-switched path (This is supported, for example, by element 840 of Figure 8 and paragraph [0049] of the specification.); (f) receiving a second message for establishing a second label-switched path (This is supported, for example, by element 902 of Figure 9 and paragraph [0052] of the specification.); (g) determining that the second message includes extended information (This is supported, for example, by Figure 7, element 815 of Figure 8, element 906 of Figure 9 and paragraphs

[0042], [0043], [0045], [0047] and [0052] of the specification.); (h) finding a second label-switched route using a second part of the second message (This is supported, for example, by element 730 of Figure 7, elements 815, 825 and 830 of Figure 8, element 916 of Figure 9, and paragraphs [0042], [0047], [0049] and [0055] of the specification.); (i) determining that an interface of the second matching label-switched route found matches an interface on which the second message was received (This is supported, for example, by elements 830 and 835 of Figure 8, elements 916 and 918 of Figure 9, and paragraphs [0047] and [0055] of the specification.); and (j) generating a second further message to signal the second label-switched path (This is supported, for example, by element 840 of Figure 8, element 926 of Figure 9, and paragraphs [0047], [0049] and [0055] of the specification.)

VI. Grounds of Rejection to be Reviewed on Appeal

The issues presented for review are (1) whether claims 14, 16, 17, 19 and 24 are directed to statutory subject matter under the provisions of 35 U.S.C. § 101, and (2) (whether (separately patentable groups of) claims 1-14, 16, 17, 19 and 24-48 are unpatentable, under the provisions of 35 U.S.C. § 103(a), over the Tinsley patent in view of the Renwick patent.

VII. Argument

The Appellant respectfully requests that the Board reverse the final rejection of claims 1-14, 16, 17, 19 and 24-48 in view of the following.

Objections

Claims 45-48 are objected to because the Examiner contends that claims 45-48 should depend from independent claim 44 instead of independent claim 1. (See Paper No. 20080514, page 2.) However, the Appellant notes that claims 45-48 correctly depend from claim 1. Claims 45-48 further recite that the ***first part*** of the message includes a FEC-label association, that the ***first part*** of the message includes a label distribution protocol label-mapping, that the ***second part*** of the message includes resolution next hop information, and that the ***further message*** generated is a label mapping message, respectively. Thus, the Appellant respectfully requests that this objection be reversed.

Rejections under 35 U.S.C. § 101

Claims 14, 16, 17, 19 and 24 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The appellant respectfully requests that the Board reverse this ground of rejection in view of the following.

In rejecting claim 14, the Examiner contends that claim 14 recites a data structure that is not in a manner so as to be executable by a computer/processor. Further, the Examiner contends that claim 14 recites a collection of fields, per se, which is not an actual data structure,

instead being non-functional descriptive material. (See Paper No. 20080514, pages 2 and 3.)

Claim 14 recites that each of the three fields is stored in association with a label-switched path. Accordingly, the claim recites "a physical or logical relationship among data elements, designed to support specific data manipulation functions," and not a mere collection of unrelated fields. Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility," OG Notices, (November 22, 2005).

In addition, the Appellant respectfully notes that the data structure need not be program instructions executable by a computer or a processor. Indeed, Guidelines of the US Patent Office state:

> a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory

"Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility," OG Notices, (November 22, 2005).

Furthermore, claim 14 clearly recites the functional utility provided by the data structure when processed by a forwarding device. Specifically, claim 14 recites in pertinent part:

> wherein a forwarding device, receiving the message, processes the message to (1) determine whether or not the forwarding device has a routing table

> entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field, and (2) use the label included in the first field for forwarding data only if the forwarding device determined that the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field.

Thus, claim 14 recites a physical or logical relationship among data elements, designed to support specific data manipulation functions (i.e., functional descriptive material) stored on a machine-readable storage device. (Note that the exemplary storage devices described in paragraph [0061] of the specification of the present application may be computer-readable.)

The Appellant respectfully submits that claims 14, 16, 17, 19 and 24 recite statutory subject matter in view of the foregoing. (Claims 16, 17, 19 and 24 directly or indirectly depend from claim 14.) Consequently, the Appellant respectfully requests that the Board reverse this ground of rejection.

Rejections under 35 U.S.C. § 103

Claims 1-14, 16, 17, 19 and 24-48 stand rejected under U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,965,592 ("the Tinsley patent") in view of U.S. Patent No. 7,151,775 ("the Renwick patent"). The

Appellant respectfully requests that the Board reverse this ground of rejection in view of the following.

Group I: Claims 1-5, 11, 12, 25-29, 35, 36, 38-43 and 45, 46 and 48

Independent claims 1 and 25 are not rendered obvious by the Tinsley and Renwick patents because these patents, either taken alone or in combination, fail to teach or suggest acts of (or means for) determining whether or not a message includes extended information, if the message does not include extended information, determining, using a first part of the message and routing information, whether or not to generate a further message to signal the label-switched path, and ***if the message does include extended information, determining, using a second part of the message and routing information, whether or not to generate a further message to signal the label-switched path***. Further, one skilled in the art would not have been motivated to combine the Tinsley and Renwick patents as proposed by the Examiner.

In rejecting claims 1 and 25, the Examiner contends that the Tinsley patent teaches a method for establishing a label-switched path and using a first part of a message if the message does not include extended information, and using a second part of the message if the message includes extended information. (See Paper No. 20080514, pages 3, 6 and 7.) Specifically, during a telephone interview with the Examiner conducted on January 8, 2008 (referred to as "the telephone interview"), the Examiner

explained that he is interpreting the IPV6 header (602 of Figure 6(A) of the Tinsley patent) as the claimed "first part of a message" and the MPLS header (604 of Figure 6(A) of the Tinsley patent) as both the claimed "second part of a message" and the claimed "extended information". The Appellant respectfully disagrees with these characterizations.

The Tinsley patent describes distributing SS7 functions, previously performed centrally, using distributed gateway routing elements (DGREs). Figure 8 of the Tinsley patent illustrates routing (that is, forwarding) an outgoing SS7 message by a DGRE. Figure 9 of the Tinsley patent illustrates processing a received SS7 message. In both cases, a virtual interprocessor message transport (IMT) bus is used to communicate messages between DGREs. Multiprotocol label switching (MPLS) is described in columns 6 and 7 as a way of ensuring quality of service (QoS) for communications between the DGREs. Thus, MPLS is described as one way of providing a virtual IMT bus with an appropriate QoS.

Note that the Tinsley patent does not concern receiving a message for ***establishing*** a label-switched path (LSP) as recited in claims 1 and 25. Although multiprotocol label switching (MPLS) can provide a label-switch path, the Tinsley patent is concerned with communications that might be facilitated by ***previously established*** MPLS-based label-switched paths. Further, although SS7 concerns call setup, call teardown and database access features, it does not concern establishing a ***label-switched path***.

Furthermore, packet 600 of Figure 6(A) of the Tinsley patent is for carrying data to be communicated

(via the virtual IMT bus) among distributed SS7 DGREs. The IP header 602 and MPLS header 604 are simply used to ***forward*** the packets, preferably with an appropriate quality of service (QoS), and are not used to determine whether or not to generate a further message to signal a label-switched path.

The Examiner concedes that the Tinsley patent does not teach determining whether or not to generate a further message to signal the label-switched path. (See Paper No. 20080514, page 3.) However, the Examiner cites the Renwick patent as teaching this feature. The Appellant respectfully disagrees.

The Renwick patent concerns providing techniques for allocating multiple label-switched paths in a route that has multiple physical links using MPLS. The Renwick patent attempts to distribute traffic to relieve congestion while ensuring that the traffic of individual flows is not routed over different paths. Although the Renwick patent concerns establishing label-switched paths, it does not ***determine whether to use a first part or a second part of a message to generate a further message for signaling the label-switched path depending on whether the message includes extended information.***

As can be appreciated from the foregoing, the Tinsley and Renwick patents neither teach, nor suggest, the acts and means recited in independent claims 1 and 25, respectively. Thus, the claims are not rendered obvious by the Tinsley and Renwick patents for at least this reason. Since claims 2-5, 11, 12, 38, 40, 41 and 45, 46 and 48 directly or indirectly depend from claim 1, and since claims 26-29, 35, 36, 39, 42 and 43 directly or indirectly depend from claim 25, these claims are

similarly not rendered obvious by the Tinsley and Renwick patents.

Further, one skilled in the art would not have been motivated to combine these patents as proposed by the Examiner. As stated above, the Examiner concedes that the Tinsley patent does not teach determining whether or not to generate a further message to signal the label-switched path. (See Paper No. 20080514, page 3.) This is naturally the case since the Tinsley patent discusses using ***previously established*** MPLS paths, with quality of service (QoS) guarantees, thereby defining a virtual IMT bus to enable communications between distributed DGREs. (See, e.g., column 5, lines 14-25 and column 6, lines 56-59 of the Tinsley patent.) In the Tinsley patent, the IP header 602 and MPLS header 604 are part of a packet 600 used for SS7 call signaling over an existing label-switched path. It is not used for establishing a label-switched path.

Since the Renwick patent concerns establishing multiple label-switched paths in a route that has multiple physical links using MPLS, one skilled in the art would not have been motivated to modify an aspect of the Tinsley patent that occurs ***after a label-switched path already exists*** in view of the Renwick patent. Even assuming, arguendo, that one skilled in the art were to combine the Tinsley and Renwick patents in their entirety, the results would be a distributed gateway of DGREs performing SS7 routing functions which establishes multiple label-switched paths over multiple physical links for ensuring QoS for communications between the DGREs. However, such a combination would differ from the claimed invention since the label-switched paths

established for QoS purposes would not be established based on determining whether to use a first or second part of a message to generate a further message for signaling the label-switched path depending on whether the message includes extended information.

Thus, independent claims 1 and 25 are not rendered obvious by the Tinsley and Renwick patents for at least this additional reason. Since claims 2-13, 38, 40, 41 and 45-48 directly or indirectly depend from claim 1, and since claims 26-37, 39, 42 and 43 directly or indirectly depend from claim 25 these claims are similarly not rendered obvious by the Tinsley and Renwick patents.

Group II: Claims 14, 16, 17, 19 and 24

Independent claim 14 is not rendered obvious by the Tinsley and Renwick patents because these patents neither teach, nor suggest, a first field including a label stored in association with a label-switched path, a second field including forwarding equivalency class information stored in association with the label-switched path, and a third field including label-switched path signaling resolution information stored in association with the label-switched path, the label-switched path signaling resolution information including one of a host address and a host prefix, wherein a forwarding device, receiving the message, processes the message to (1) determine whether or not the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field, and (2) use the label

included in the first field for forwarding data only if the forwarding device determined that the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field.

The Examiner applied the Tinsley and Renwick patents to claim 14. Although the IP packet 600 of Figure 6A of the Tinsley patent includes a label 610, it does not include a second field including forwarding equivalency class information stored in association with the label-switched path, and a third field including label-switched path signaling resolution information stored in association with the label-switched path, the label-switched path signaling resolution information including one of a host address and a host prefix. Furthermore, the Renwick patent does not compensate for the deficiencies of the Tinsley patent because the Renwick patent also does not teach a third field including label-switched path signaling resolution information (which is different from the label stored in the first field and the FEC information stored in the second field) stored in association with the label-switched path, the label-switched path signaling resolution information including one of a host address and a host prefix.

Thus, independent claim 14 is not rendered obvious by the Tinsley and Renwick patents for at least the foregoing reason. Since claims 16, 17, 19 and 24 directly or indirectly depend from claim 14, these claims are similarly not rendered obvious by the Tinsley and Renwick patents.

Group III: Claim 44

In rejecting claim 44, the Examiner states that claim 44 is "rejected for the same reasons set forth to rejecting claims 1-6 above, since claim 44-48 do not teach or define any new or additional limitations than above claim 1-6." (See Paper No. 20080514, page 7.) However, claim 44 was added in response to a statement made by the Examiner during the telephone interview suggesting that element (c) of claim 1 need not be given any weight if element (b) is always met. That is, claim 1 may be interpreted by some to recite that the messages received for establishing a label-switched path never include extended information and thus are always processed normally while ignoring the other features of the claims.

Although the Appellant does not agree with such an interpretation, claim 44 was added to avoid such an interpretation and explicitly recites receiving a first message which does not include extended information and the subsequent acts which take place upon receiving a message which does not include extended information, and receiving a second message which does include extended information and the subsequent acts which take place upon receiving a message which does include extended information.

Furthermore, as discussed above with reference to claims 1 and 25 of Group I, during the telephone interview, the Examiner explained that he is interpreting the IPV6 header (602 of Figure 6(A) of the Tinsley

patent) as the claimed "first part of a message" and the MPLS header (604 of Figure 6(A) of the Tinsley patent) as both the claimed "second part of a message" and the claimed "extended information". The Appellant respectfully disagrees with these characterizations.

The Tinsley patent describes distributing SS7 functions, previously performed centrally, using distributed gateway routing elements (DGREs). Figure 8 of the Tinsley patent illustrates routing (that is, forwarding) an outgoing SS7 message by a DGRE. Figure 9 of the Tinsley patent illustrates processing a received SS7 message. In both cases, a virtual interprocessor message transport (IMT) bus is used to communicate messages between DGREs. MPLS is described in columns 6 and 7 as a way of ensuring quality of service ("QoS") for communications between the DGREs. Thus, MPLS is described as one way of providing a virtual IMT bus with an appropriate QoS.

Note that the Tinsley patent does not concern receiving a message for ***establishing*** a label-switched path (LSP) as recited in claim 44. Although multiprotocol label switching ("MPLS") can provide a label-switch path, the Tinsley patent is concerned with communications that might be facilitated by ***previously established*** MPLS-based label-switched paths. Further, although SS7 concerns call setup, call teardown and database access features, it does not concern establishing a ***label-switched path***.

In addition, packet 600 of Figure 6(A) of the Tinsley patent is for carrying data to be communicated (via the virtual IMT bus) among distributed SS7 DGREs. The IP header 602 and MPLS header 604 are simply used to

forward the packets, preferably with an appropriate quality of service (QoS), and are not used to determine whether or not to generate a further message to signal a label-switched path.

The Examiner concedes that the Tinsley patent does not teach determining whether or not to generate a further message to signal the label-switched path. (See Paper No. 20080514, page 3.) However, the Examiner cites the Renwick patent as teaching this feature. The Appellant respectfully disagrees.

The Renwick patent concerns providing techniques for allocating multiple label-switched paths in a route that has multiple physical links using MPLS. The Renwick patent attempts to distribute traffic to relieve congestion while ensuring that the traffic of individual flows is not routed over different paths. Although the Renwick patent concerns establishing label-switched paths, it does not ***determine whether to use a first part or a second part of a message to generate a further message for signaling the label-switched path depending on whether the message includes extended information.***

As can be appreciated from the foregoing, the Tinsley and Renwick patents neither teach, nor suggest, the acts recited in independent claim 44. Thus, claim 44 is not rendered obvious by the Tinsley and Renwick patents for at least this reason. Further, one skilled in the art would not have been motivated to combine these patents as proposed by the Examiner. As stated above, the Examiner concedes that the Tinsley patent does not teach determining whether or not to generate a further message to signal the label-switched path. (See Paper No. 20080514, page 3.) This is naturally the case since

the Tinsley patent discusses using ***previously established*** MPLS paths, with quality of service (QoS) guarantees, thereby defining a virtual IMT bus to enable communications between distributed DGREs. (See, e.g., column 5, lines 14-25 and column 6, lines 56-59 of the Tinsley patent.) In the Tinsley patent, the IP header 602 and MPLS header 604 are part of a packet 600 used for SS7 call signaling over an existing label-switched path. It is not used for establishing a label-switched path.

Since the Renwick patent concerns establishing multiple label-switched paths in a route that has multiple physical links using MPLS, one skilled in the art would not have been motivated to modify an aspect of the Tinsley patent that occurs after a label-switched path already exists in view of the Renwick patent. Even assuming, arguendo, that one skilled in the art were to combine the Tinsley and Renwick patents in their entirety, the results would be a distributed gateway of DGREs performing SS7 routing functions which establishes multiple label-switched paths over multiple physical links for ensuring QoS for communications between the DGREs. However, such a combination would differ from the claimed invention since the label-switched paths established for QoS purposes would not be established based on determining whether to use a first or second part of a message to generate a further message for signaling the label-switched path depending on whether the message includes extended information.

Thus, independent claim 44 is not rendered obvious by the Tinsley and Renwick patents for at least this reason.

Group IV: Claims 6-8, 10, 30-32, 34 and 47

Dependent claims 6-8, 10 and 47 directly or indirectly depend from independent claim 1 and claims 30-32 and 34 directly or indirectly depend from independent claim 25. Therefore, these claims are not rendered obvious for at least the reasons discussed with respect to the claims of Group I above. In addition, claims 6 and 30 further recite that the extended information includes ***resolution next hop information***, and claim 47 further recites that the second part of the message includes ***resolution next hop information***. In rejecting claims 6, 30, and 47 the Examiner cites Figures 4-6 and column 5, line 57 through column 7, line 57 of the Tinsley patent. (See Paper No. 20080514, page 4) The Appellant respectfully disagrees.

Resolution next hop ("RNH") information is described in the specification as follows:

> In one embodiment consistent with principles of the invention, a new type-length-value (TLV) data structure is defined as an extension to LDP messages. ***The new TLV, referred to as the "resolution next hop"*** (RNH) TLV, may be used in label mapping, label withdraw and/or label release messages. When the RNH TLV is present in a label withdraw message or release messages, the label TLV should be present as well.
>
> Figure 7 illustrates an exemplary message data structure 700, as well as an exemplary data structure for carrying RNH information. Specifically, exemplary message data structure 700 may include label

> information 710, FEC information 720 and RNH information 730.
>
> In an exemplary field format consistent with the principles of the invention, ***RNH information 730 may include a 14-bit field 736 including an RNH identifier. Two leading zeroes 732,734 may be used to instruct nodes what to do when they don't recognize field 736. Such a mechanism may be used to ensure correct interoperability between new nodes and old nodes. Specifically, a node may interpret the "00" such that, in the event that field 736 is unrecognized, message 700 is not forwarded, and a notification is sent to the sender. This behavior is defined in RFC 3036 (the U and F bits). The RNH identifier in field 736 is a TLV type, and may be used by nodes, such as LSRs, to recognize the information 730 as RNH information. A 16-bit field 738 may include the length, in bytes of the value field of the TLV. In this case, the value field includes the address family field 740, the MBZ field 742 and the host address or prefix field 744. A 16-bit field 740 may carry address family information. Address family field 740 may contain a value from "Address Family Numbers" in RFC 1700 that encodes the address family for the address prefix in the Host Address (or Prefix) field. A must be zero (MBZ) field 742 may be used to align further fields at 4-byte boundaries. Field 744 may include a host address or prefix encoded according to address family field 740***. [Emphasis added.]

(Paragraphs [0041]-[0043] of the present application) As can be appreciated from the foregoing, the resolution next hop information contains detailed information which may be used to advantageously permit LDP-signaled LSPs

without requiring information about remote Autonomous Systems ("ASs") (e.g., FEC element prefixes or host addresses that are external to the IGP) to be injected into the local IGP. It is this detailed information which is analyzed to determine whether or nor to generate a further message to signal the label-switched path.

By contrast, the portion of the Tinsley patent cited by the Examiner does not describe that the IP header and MPLS header information in the Tinsley patent includes RNH information as described in the present application. More specifically, the information included in the IP header 602 and MPLS header 604 are simply used to ***forward*** packets, preferably with an appropriate quality of service (QoS), and are not used to determine whether or not to generate a further message to signal a label-switched path. The purported teachings of the Renwick patent fail to compensate for the aforementioned deficiencies of the Tinsley patent.

Thus, dependent claims 6, 30 and 47 are not rendered obvious by the Tinsley and Renwick patents for at least this additional reason. Since claims 7, 8 and 10 directly or indirectly depend from claim 6, and since claims 31, 32 and 34 directly or indirectly depend from claim 30, these claims are similarly not rendered obvious by the cited references.

Group V: Claims 9 and 33

Dependent claims 9 and 33 indirectly depend from independent claims 1 and 25, respectively. Therefore, these claims are not rendered obvious for at least the reasons discussed with respect to the claims of Group I

above. In addition, dependent claims 9 and 33 indirectly depend from dependent claims 6 and 30, respectively. Therefore, these claims are not rendered obvious for at least the reasons discussed with respect to the claims of Group IV above. Furthermore, claims 9 and 33 further recite that the second node is an ***autonomous system border router***. In rejecting claims 9 and 33, the Examiner cites Figures 1 and 2, column 2, lines 5-65, and column 4, line 59 through column 6, line 32 of the Renwick patent as teaching this feature. (See Paper No. 20080514, page 5.) The Appellant respectfully disagrees.

The portions of the Renwick patent cited by the Examiner describe ingress and egress routers used within ***a network*** 10 which "includes subnetworks 22 over which packets can be transferred en route from a source node 12 to a destination node 14." (Column 5, lines 6-8 of the Renwick patent) Thus, the entire network 10 in the Renwick patent appears to be a single autonomous system ("AS"). Thus, the ingress and egress nodes described in the Renwick patent are not autonomous system border routers since they appear to be functioning within a single autonomous system. The purported teachings of the Tinsley patent fail to compensate for the aforementioned deficiencies of the Renwick patent.

Thus, dependent claims 9 and 33 are not rendered obvious by the Tinsley and Renwick patents for at least this additional reason.

Group VI: Claims 13 and 37

Dependent claims 13 and 37 indirectly depend from independent claims 1 and 25, respectively. Therefore,

these claims are not rendered obvious for at least the reasons discussed with respect to the claims of Group I above. In addition, claim 13 further recites that the method is performed by a second node in a first network domain, and that the ingress node is in a second network domain. In rejecting claim 13 the Examiner cites Figures 1 and 2, column 1, lines 50-62, column 2, lines 5-65, column 3, lines 34-50 and column 4, line 59 through column 6, line 32 of the Renwick patent as teaching this feature. (See Paper No. 20080514, page 5.) The Appellant respectfully disagrees.

The portions of the Renwick patent cited by the Examiner describe ingress and egress routers used within ***a network*** 10 which "includes subnetworks 22 over which packets can be transferred en route from a source node 12 to a destination node 14." (Column 5, lines 6-8 of the Renwick patent) As discussed above with respect to the claims of Group V, the entire network 10 in the Renwick patent appears to be a single autonomous system ("AS") and within a single network domain. Thus, the ingress node does not appear to be in a second network domain. The purported teachings of the Tinsley patent fail to compensate for the aforementioned deficiencies of the Renwick patent.

Thus, dependent claim 13 is not rendered obvious by the Tinsley and Renwick patents for at least this additional reason. Corresponding apparatus claim 37 is similarly not rendered obvious by the cited references.

XIII. Claims appendix

An appendix containing a copy of the claims on appeal is filed herewith.

IX. Evidence appendix

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, nor is there any other evidence entered by the Examiner and relied upon by the Appellant in the appeal.

X. Related proceedings appendix

There are no decisions rendered by a court of the Board in any proceeding identified in section II above pursuant to 37 C.F.R. § 41.38 (c) (1) (ii).

Conclusion

In view of the foregoing, the Appellant respectfully submits that the pending claims are in condition for allowance. Accordingly, the Appellant requests that the Board reverse each of the outstanding grounds of rejection.

Any arguments made in this appeal pertain ***only*** to the specific aspects of the invention ***claimed***. Any arguments, are made ***without prejudice to, or disclaimer of***, the Appellant's right to seek patent protection of any unclaimed (e.g., narrower, broader, different) subject matter, such as by way of a continuation or divisional patent application for example.

Since the Appellant's remarks and/or filings with respect to the Examiner's objections and/or rejections are sufficient to overcome these objections and/or rejections, the Appellant's silence as to assertions by the Examiner in the Office Action and/or to certain facts or conclusions that may be implied by objections and/or rejections in the Office Action (such as, for example, whether a reference constitutes prior art, whether references have been properly combined or modified, whether dependent claims are separately patentable, etc.) is not a concession by the Appellant that such assertions and/or implications are accurate, and that all requirements for an objection and/or a rejection have been met. Thus, the Appellant reserve the right to analyze and dispute any such assertions and implications in the future.

Respectfully submitted,

December 1, 2008

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper (and any accompanying paper(s)) is being facsimile transmitted to the United States Patent Office on the date shown below.

John C. Pokotylo
Type or print name of person signing certification

Signature

December 1, 2008
Date

CLAIMS APPENDIX PURSUANT TO
37 C.F.R. § 41.37 (c) (1) (viii)

Claim 1 (previously presented): A method comprising:

a) receiving a message for establishing a label-switched path;

b) determining whether or not the message includes extended information;

c) if the message does not include extended information, determining, using a first part of the message and routing information, whether or not to generate a further message to signal the label-switched path; and

d) if the message does include extended information, determining, using a second part of the message and routing information, whether or nor to generate a further message to signal the label-switched path.

Claim 2 (original): The method of claim 1, wherein the message is a label-mapping message.

Claim 3 (original): The method of claim 1, wherein the message includes a FEC-label association.

Claim 4 (original): The method of claim 1, wherein the message includes a label distribution protocol label-mapping.

Claim 5 (original): The method of claim 1, wherein the routing information was determined using an interior gateway protocol.

Claim 6 (original): The method of claim 1, wherein the extended information includes resolution next hop information.

Claim 7 (original): The method of claim 6, wherein the resolution next hop information includes a host address or prefix.

Claim 8 (original): The method of claim 7, wherein the method is performed by a first node in a network domain, and

wherein the host address or prefix is of a second node in the network domain.

Claim 9 (original): The method of claim 8, wherein the second node is an autonomous system border router.

Claim 10 (original): The method of claim 8, wherein the first node runs an interior gateway protocol for generating routing information in the first node, and

wherein the routing information includes an entry for the second node.

Claim 11 (original): The method of claim 1, wherein the first part of the message includes an address or prefix of a node.

Claim 12 (original): The method of claim 11, wherein the node is an ingress node of the label-switched path.

Claim 13 (original): The method of claim 12, wherein the method is performed by a second node in a first network domain, and

wherein the ingress node is in a second network domain.

Claim 14 (previously presented): A machine-readable storage device storing a machine-readable message comprising:

a) a first field including a label stored in association with a label-switched path;

b) a second field including forwarding equivalency class information stored in association with the label-switched path; and

c) a third field including label-switched path signaling resolution information stored in association with the label-switched path, the label-switched path signaling resolution information including one of a host address and a host prefix,

wherein a forwarding device, receiving the message, processes the message to (1) determine whether or not the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field, and (2) use the label included in the first field for forwarding data only if the forwarding device determined that the forwarding device has a routing table entry that matches at least one of (A) the forwarding equivalency class information included in the second field, and (B) the host address or the host prefix included in the third field.

Claim 15 (canceled)

Claim 16 (previously presented): The machine-readable storage device of claim 14, wherein the forwarding equivalency class information includes an address or prefix of a second node in a remote network domain, and

wherein the host address or the host prefix included in the third field is of a first node which is in a local network domain, and

wherein the data forwarding device is in the local network domain.

Claim 17 (original): The machine-readable storage device of claim 16, wherein the first node is an automonous system border router.

Claim 18 (canceled)

Claim 19 (original): The machine-readable storage device of claim 14, wherein the message is a label mapping message.

Claims 20-23 (canceled)

Claim 24 (original): The machine-readable storage device of claim 14, wherein the message is a label distribution protocol label mapping message.

Claim 25 (previously presented): Elements comprising:

a) a means for receiving a message for establishing a label-switched path;

b) means for determining whether or not the message includes extended information;

c) means for determining, using a first part of the message and routing information, whether or not to generate a further message to signal the label-switched path if the message does not include extended information; and

d) means for determining, using a second part of the message and routing information, whether or nor to generate a further message to signal the label-switched path if the message does include extended information.

Claim 26 (original): The elements of claim 25, wherein the message is a label-mapping message.

Claim 27 (original): The elements of claim 25, wherein the message includes a FEC-label association.

Claim 28 (original): The elements of claim 25, wherein the message includes a label distribution protocol label-mapping.

Claim 29 (original): The elements of claim 25, wherein the routing information was determined using an interior gateway protocol.

Claim 30 (original): The elements of claim 25, wherein the extended information includes resolution next hop information.

Claim 31 (original): The elements of claim 30, wherein the resolution next hop information includes a host address or prefix.

Claim 32 (original): The elements of claim 31, wherein the elements are included in a first node in a network domain, and

wherein the host address or prefix is of a second node in the network domain.

Claim 33 (original): The elements of claim 32, wherein the second node is an autonomous system border router.

Claim 34 (original): The elements of claim 32, wherein the first node runs an interior gateway protocol for generating routing information in the first node, and

wherein the routing information includes an entry for the second node.

Claim 35 (original): The elements of claim 25, wherein the first part of the message includes an address or prefix of a node.

Claim 36 (original): The elements of claim 35, wherein the node is an ingress node of the label-switched path.

Claim 37 (original): The elements of claim 36, wherein the elements are included in a second node in a first network domain, and

wherein the ingress node is in a second network domain.

Claim 38 (previously presented): The method of claim 1, wherein the second part of the message includes at least one of a host address and a host prefix corresponding to a node within a local network domain.

Claim 39 (previously presented): The elements of claim 25, wherein the second part of the message includes at least one of a host address and a host prefix corresponding to a node within a local network domain.

Claim 40 (previously presented): The method of claim 1, further comprising:

d) generating, if it is determined to generate a further message to signal the label-switched path, a label mapping message.

Claim 41 (previously presented): The method of claim 1, further comprising:

d) generating, if it is determined to generate a further message to signal the label-switched path, a label mapping message including an outgoing label; and

e) creating a forwarding state binding between the outgoing label and a label in the message.

Claim 42 (previously presented): The elements of claim 25, further comprising:

d) means for generating, if it is determined to generate a further message to signal the label-switched path, a label mapping message.

Claim 43 (previously presented): The elements of claim 25, further comprising:

d) means for generating, if it is determined to generate a further message to signal the label-switched path, a label mapping message including an outgoing label; and

e) means for creating a forwarding state binding between the outgoing label and a label in the message.

Claim 44 (previously presented): A method for use by a data forwarding device comprising:

a) receiving a first message for establishing a first label-switched path;

b) determining that the first message does not include extended information;

c) finding a first label-switched route matching a first part of the first message;

d) determining that an interface of the first matching label-switched route found matches an interface on which the first message was received;

e) generating a first further message to signal the first label-switched path;

f) receiving a second message for establishing a second label-switched path;

g) determining that the second message includes extended information;

h) finding a second label-switched route using a second part of the second message;

i) determining that an interface of the second matching label-switched route found matches an interface on which the second message was received; and

j) generating a second further message to signal the second label-switched path.

Claim 45 (previously presented): The method of claim 1 wherein the first part of the message includes a FEC-label association.

Claim 46 (previously presented): The method of claim 1 wherein the first part of the message includes a label distribution protocol label-mapping.

Claim 47 (previously presented): The method of claim 1 wherein the second part of the message includes resolution next hop information.

Claim 48 (previously presented): The method of claim 1 wherein the further message generated is a label mapping message.

EVIDENCE APPENDIX PURSUANT TO
37 C.F.R. § 41.37 (c) (1) (ix)

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132, nor is there any other evidence entered by the Examiner and relied upon by the appellant in the appeal.

RELATED PROCEEDINGS APPENDIX PURSUANT TO 37 C.F.R. § 41.37 (c) (1) (x)

There are no decisions rendered by a court of the Board in any proceeding identified in section II of the Substitute Supplemental Appeal Brief pursuant to 37 C.F.R. § 41.37 (c) (1) (ii).